3 October 1969

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW SPECIES OF SPIONIDS (POLYCHAETA) FROM THE GULF OF MEXICO AND CARIBBEAN SEA WITH A PARTIAL REVISION OF THE GENUS *PRIONOSPIO*

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In connection with a study of the Spionidae of the Gulf of Mexico and Caribbean Sea, several new taxa have been encountered. This paper deals with the descriptions of two new species, one of which represents a new genus, and the restablishment of a second genus.

I wish to acknowledge Dr. Olga Hartman and Dr. Lucien Laubier for the loan of type material for examination. I thank Dr. John Day for the offer of his specimens, notes and drawings of one of the new species described herein. Finally, I would like to thank Dr. Marion Pettibone and Dr. Meredith Jones for their constructive comments with regard to the writing of this manuscript. This work was supported by a Smithsonian Pre-doctoral Internship and all type material is deposited in the Smithsonian Institution.

The following are covered in this study:

Discussion of *Prionospio* Malmgren, 1867
Apoprionospio new genus *A. dayi* new species
A. nova (Annenkova, 1938) new combination
A. saldanha (Day, 1961) new combination
A. pygmaea (Hartman, 1961) new combination
A. caspersi (Laubier, 1962) new combination
Key to species of *Apoprionospio*

Paraprionospio Caullery, 1914 [= *Prionospio* (*Paraprionospio*) Caullery]
P. pinnata (Ehlers, 1901) new combination
Aonides Claparède, 1864 *A. mayaguezensis* new species
Key to species of *Aonides*

The genus *Prionospio* Malmgren, 1867 was originally limited to species possessing gills beginning on setiger two. Caullery (1914) erected *Paraprionospio* as a subgenus to accommodate the species *Prionospio pinnata*, which possesses branchiae beginning on the first setiger. Later *Paraprionospio* was used at the generic level by Berkeley (1927) and Weese (1933). This usage, however, was not continued by later systematists. Rather than accept *Paraprionospio* as a genus or subgenus, the limits of *Prionospio* were merely expanded to include it. This apparently has been the tendency with regard to *Prionospio* with the result that at present, *Prionospio* includes an extremely heterogenous group of species. The species of this genus can be separated into distinct groups on the basis of type and arrangement of the gills. Previously all species with the following characters have been assigned to the genus *Prionospio*:

1. anterior branchiae first present on setigers one, two or three; separate from dorsal lamellae; pinnate and/or cirriform.
2. rounded prostomium, lacking frontal horns and occipital tentacles.
3. neuropodial and notopodial hooded hooks, bidentate or multidentate.
4. well-developed anterior parapodial lamellae.

On the basis of the above, the generic characters of *Prionospio* do not consider the question of gill type and arrangement, giving no indication of their pinnate or cirriform nature. In other valid genera of the Spionidae, the species form homogeneous groups with regard to the branchiae. Therefore, after consideration of the characters involved in generic diagnoses within the family as a whole, I have decided to divide *Prionospio* into several genera. It is recognized that these divisions may be

found to be too artificial and that subgeneric designations would be more acceptable.

Two groups of species are herein removed from *Prionospio* and placed in *Paraprionospio* Caullery and *Apoprionospio* new genus.

Apoprionospio new genus

Type species: *Apoprionospio dayi* new species.

Diagnosis: Prostomium triangular, flared anteriorly, lacking frontal horns, bearing two pairs of eyes. Peristomium fused with setiger one surrounding prostomium posteriorly as a yoke or collar; with no lateral wings or elevations. Four pairs of branchiae beginning on setiger two; first three pairs cirriform, fourth pinnate. Neuropodial lamellae of setiger two somewhat enlarged, triangular, directed ventrally. Pygidium with anal cirri. Hooded hooks in posterior neuropodia and notopodia; bidentate or multidentate. Dorsal membranous ridges connecting notopodial lamellae at some point along the body.

Etymology: Gender—feminine; *apo*—Gr.—from, away from, separate; *priono*—<Gr.—saw; *spio*—L.—a sea nymph; alluding to the separation of the members of this genus from *Prionospio*.

Apoprionospio dayi new species

(Figs. 1–11)

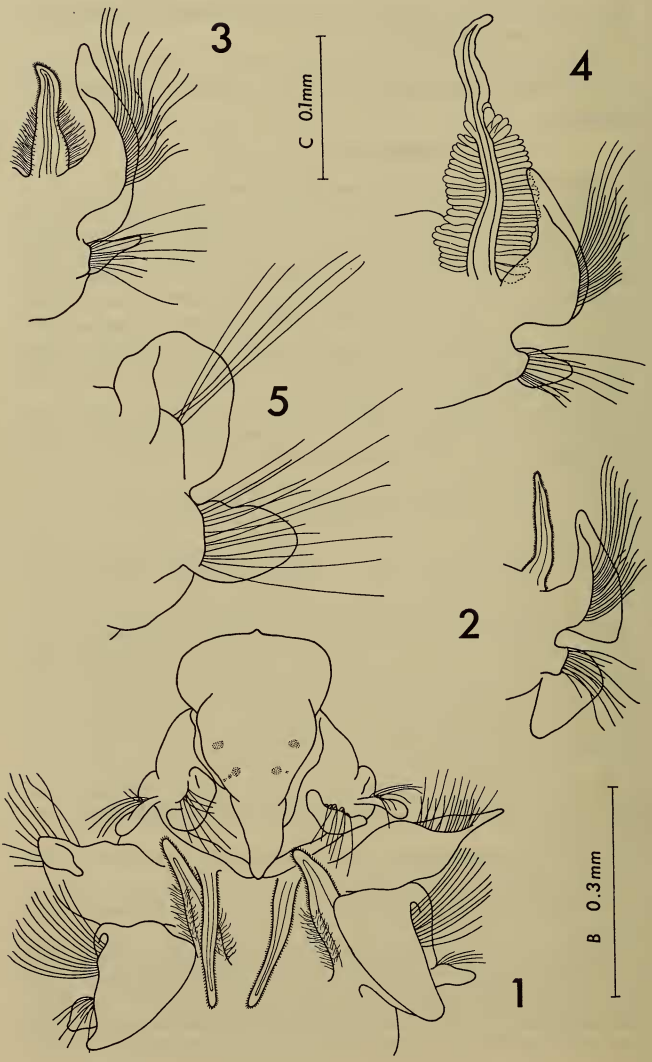
Diagnosis: Body up to 35 mm in length. Triangular prostomium with two pairs of eyes and occasionally additional eye spots. Peristomium in form of a yoke or collar rather than hood. Four pairs of branchiae; first to third, cirriform and fourth, pinnate, with pinnae extending only 1/2 to 2/3 length of the shaft. Neuropodial lamellae of setiger two larger than those of remaining setigers. Dorsal crest, between notopodial lamellae, on setiger seven. Multidentate, hooded hooks first appearing in setigers 16 to 18 of neuropodia and in setigers 27 to 40 of the notopodia. Pygidium with three anal cirri, one long mid-dorsal and two shorter laterals.

Material examined: off Beaufort, North Carolina (five specimens), Grand Isle, Louisiana (one specimen) and Port Aransas, Texas (two specimens).

Type Material: Holotype: USNM 39487; Paratype: USNM 39488. Collected off Beaufort, North Carolina.

Etymology: The species is named for Dr. John Day, Capetown, South Africa.

Description: The prostomium (Fig. 1) is triangular in shape, widest anteriorly. It narrows posteriorly and extends to about the level of setiger two. There are two pairs of eyes. Those of the anterior pair are farther apart and may be larger. There is a ridge behind the prostomium which extends across the dorsum from just behind the first parapodia. The per-


3
C 0.1mm
4
5
2
1
B 0.3mm

istomium is low and surrounds the prostomium like a collar rather than the more typical hood. There are no lateral wings. In some specimens the transverse ridge appears to be a part of this peristomial collar, its posterior continuation.

There are four pairs of branchiae; the first three cirriform and the fourth, pinnate. The first pair is slender and neither obviously ciliated nor tapered (Figs. 1 and 2). The second and third pairs are thicker and tapered, with long cilia on the proximal one-half to two-thirds of the gill shafts and shorter cilia continuing to the branchial tips (Figs. 1 and 3). The pinnate branchiae of setiger five are the longest of the four pairs. They are pinnate, the pinnae extending one-half to two-thirds the length of the shafts. They are as long as the gill width and closely adhere to one another forming one row on either side of the gill (Fig. 4).

The anterior notopodia are long and extend well above the body. The notopodial lamellae of setiger one are low, rounded and slightly cupped, while those of the neuropodia are taller and thinner (Figs. 1 and 5). The parapodial lamellae of setiger two are conspicuously different from those of the preceeding in that the neuropodial lamellae are especially large and triangular in shape with the long axis extending ventrally (Figs. 1 and 2). Notopodial lamellae have become elongate, erect and triangular with a slight anterior fold or cup opening laterally, from which the notosetae emerge. The fold becomes more pronounced in the following setigers and by setigers four to five it is almost symmetrical, forming a V-shaped cup or groove with both sides equal. At this point the lamellae are very elongate (Fig. 3) and neuropodial lamellae are thinner and triangularly tapered.

On setiger seven a dorsal ridge or crest extends across the dorsum between the notopodial lamellae. The anterior face of the cup on this setiger is more like a presetal lamella and is rounded (Fig. 6). The ridge extends from the point of "fusion" of the pre- and postsetal lamellae. The neuropodial lamella is bluntly rounded and similar to that of setiger one. The neuropodial presetal lamella is fairly well-developed, low and rounded.

On the next few setigers the notopodial lamellae are flattened, low and may extend upon the dorsal surface but do not connect to form ridges; both noto- and neuropodial presetal lamellae are well-developed (Fig. 7). In posterior setigers the notopodial lamellae are much more lateral, forming low ridges approximately level with the dorsum; the presetal lamellae have decreased in prominence and are present as low ridges; the setal bundle has shifted to a more ventral position. (Fig. 8).

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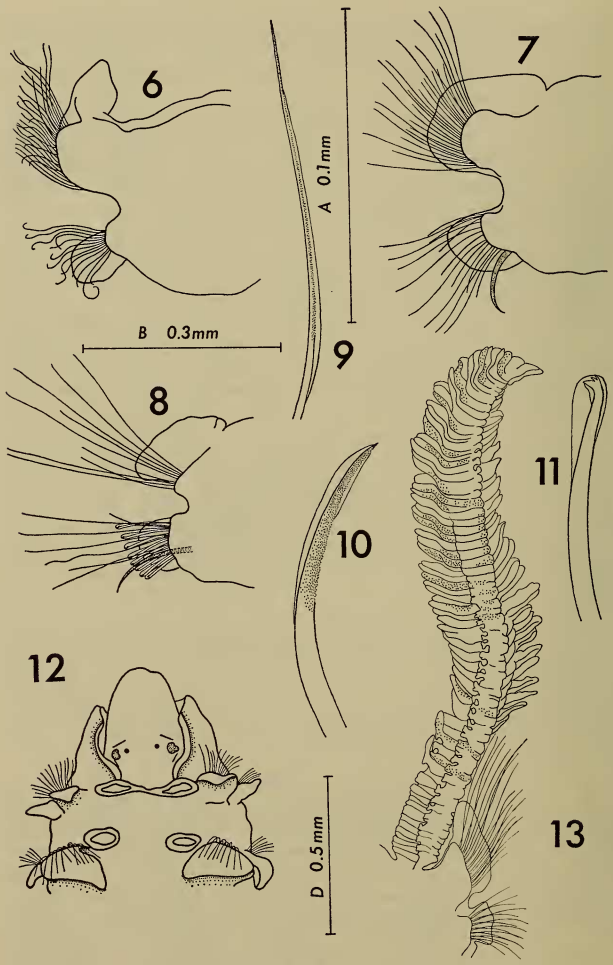
Figs. 1–5. *Apoprionospio dayi* new genus, new species. 1. Dorsal view, anterior end. 2. Setiger two, showing enlarged neuropodial lamella. 3. Setiger three. 4. Setiger five. Figs. 1–4, scale B; Fig. 5, scale C.



Figs. 6–11. *Apoprionospio dayi* new genus, new species. 6. Setiger seven. 7. Setiger 11. 8. Setiger 22. 9. Neuropodial seta from setiger one. 10. Sabre-seta from setiger 12. 11. Neuropodial hooded hook from posterior setiger. Figs. 12–13. *Paraprionospio pinnata.* 12. Dorsal view, anterior end, bases of gills shown. 13. Setiger one, pigmentation of gills shown by stipling. Figs. 9–11, scale A; Figs. 6–8, 13, scale B; Fig. 12, scale D.

Neuropodial lamellae are similar in shape to those of the notopodia but remain smaller. Posteriorly the notopodial lamellae become taller and thinner and those of the neuropodia lower and more rounded.

Anterior capillary setae are all similar, appearing unilimbate. Current work soon to be completed has indicated, however, that what was previously considered to be a limbation is in actual fact a "sheath," partially or completely surrounding the setal shaft. In *A. dayi* the capillaries show granulations, or what have previously been termed spinelets (Jones, 1962), along the area inclosed within the sheath. Two areas are clearly distinguishable on the shaft, a smooth clear outer part and a granular inner part (Fig. 9). There are few setae in setiger one. In the second setiger the notosetae increase significantly in number, and are arranged in a whorl and vary considerably in length. By setigers four to five, neuropodial setae are thinner and not as broadly sheathed as those of the notopodia. A large sabre-seta appears in setiger 11 on all specimens examined. It differs from the typical spionid sabre-seta in that it is very broadly sheathed (Fig. 7 and 10). Furthermore the sabre-setae do not always occupy the ventral-most position of the neuropodial fascicle but are often curved to emerge at the same level as some of the hooded hooks (Fig. 8).

In several setigers anterior to the first appearance of hooded hooks, neuropodial setae have become very long and are no longer granulated and broadly sheathed. Neuropodial hooded hooks appear in setigers 16 to 18. The hooks have long primary hoods and very small, closely applied secondary or internal hoods. The presence of these internal hoods was first suggested by Jones (1962) and they were referred to as "internal cylinders." The hooded hooks have two to three small teeth above the main fang (Fig. 11). The distribution of two and three denticled hooks varies and there does not seem to be a pattern. The neuropodial fascicle also includes long, thin, companion setae (Fig. 8). Notopodial hooded hooks, similar to those of the neuropodia, first appear in setigers 27 to 40.

The pygidium bears a single, long, slender, mid-dorsal and two shorter, lateral anal cirri.

Discussion: According to the above revision, the following species of *Prionospio* may be referred to *Apoprionospio* new genus:

A. nova (Annenkova, 1938) new combination. Japan Sea. Indeterminable.

A. saldanha (Day, 1961) new combination. South Africa.

A. pygmaea (Hartman, 1961) new combination. Southern California.

A. caspersi (Laubier, 1962) new combination. Lagune de Venice, Adriatic.

A. dayi new species. North Carolina, Gulf of Mexico (Louisiana, Texas).

Apoprionospio dayi differs from the closely related *A. pygmaea* by the presence of the dorsal membranous ridge on setiger seven. Examination of type material of the latter, deposited in the Allen Hancock Foundation, revealed the presence of multidentate hooded hooks rather than bidentate as indicated in the original description. The pinnate branchiae of *A. dayi* differ from those of *A. caspersi* and *A. saldanha* by having the pinnae regularly arranged in two opposing rows along the shaft, closely applied to one another and extending only about one-half the length of the gill. Examination of paratypes of the above confirmed the irregular arrangement of the pinnae and their extension along almost the entire length of the shaft. *A. pygmaea* and *A. dayi* possess multidentate hooks whereas in *A. caspersi* and *A. saldanha* they are bidentate. *Prionospio nova*, based on an incomplete specimen, is considered indeterminable at the species level; however, the gill arrangement and shape of the second neuropodial lamella agree with *Apoporionospio*.

KEY TO THE SPECIES OF THE GENUS *APOPRIONOSPIO*

1. Neuropodial hooded hooks multidentate. Pinnae of fourth branchial pair regularly situated in two opposing rows, not extending to the end of the shaft 2
1. Neuropodial hooded hooks bidentate. Pinnae irregularly arranged along shaft, extending to near tip of gill shaft 3
2. Dorsal membranous ridge on setiger seven present ..... *A. dayi*
2. Dorsal membranous ridge on setiger seven absent ..... *A. pygmaea*
3. Dorsal ridge on setiger seven present ..... *A. caspersi*
3. Dorsal ridge on setiger seven absent ..... *A. saldanha*

Genus *Paraprionospio* Caullery, 1914

Etymology: Gender:—feminine; *para*—Gr.—beside, near, by.

Type Species: *Prionospio pinnata* Ehlers, 1901, designated by Caullery, 1914.

Diagnosis: Prostomium surrounded by well-developed peristomial hood forming lateral wings. Branchiae pinnate, beginning on setiger one. Parapodia of first setiger well-developed, not particularly reduced. Noto- and neuropodial hooded hooks multidentate. Pygidium with anal cirri.

Remarks: *Paraprionospio* was originally erected for the species commonly known as *Prionospio pinnata*. In *Prionospio sensu stricto* the first setiger (*not* segment) is reduced and does not bear the gills; segments one and two are fused resulting in the loss of the first parapodia. In *P. pinnata*, however, setiger one is only slightly smaller and does bear the first pair of gills. For this reason, Caullery (1914) established the subgenus *Paraprionospio*. He pointed out that possibly either the first setiger was simply not reduced as in *Prionospio* or that the first parapodia have disappeared, with the lateral wings of the head remaining as vestiges of the first setiger. Later Söderström (1920) synonymized the two genera

saying that, as in *Prionospio*, segments one and two have fused resulting in parapodial loss so that the gills actually begin on segment three. The fact remains, however, that if one considers a suite of characters, *Paraprionospio* can be distinguished as a separate genus. The following Table illustrates some of these differences.

TABLE 1. Comparison of *Paraprionspio* and *Prionospio*.

Genus	First appearance of gills	Gill sheath	Peristomial wings	Size of first parapodia
Paraprionospio	setiger 1	present	very pronounced	not significantly reduced
Prionospio	setiger 2	absent	absent	much reduced

Paraprionospio also shows a very close relationship to the genus *Streblospio*. Characteristics in common include prostomium enclosed in a hood, branchiae beginning on setiger one and similar setae.

Paraprionospio pinnata (Ehlers, 1901) new combination
(Figs. 12–21)

Prionospio pinnata Ehlers, 1901, p. 163; 1912, p. 110-Augener, 1927, p. 351.-Monro, 1923, p. 68.-Fauvel, 1936, p. 60-Okuda, 1936, p. 247; 1937, p. 49.-Berkeley and Berkeley, 1941, p. 42; 1952, p. 30.-Wesenberg-Lund, 1949, p. 325.-Hartman and Reish, 1950, p. 29.-Tebble, 1955, p. 124.-Hartman, 1955, p. 182; 1963a, p. 43; 1963b, pp. 74, 123, 131, 148, 167, 179, 194, 211, 231, 247, 258, 277, 296, 328, 344, 358, 375, 398; 1967, pp. 11, 113.-Kirkegaard, 1959, p. 22.-Reish, 1961, p. 86; 1959, pp. 38, 61, 64, 67, 71, 75, 78.-Barnard and Reish, 1959, pp. 9, 71, 73, 88.-Day, 1961, p. 485; 1967, p. 488.-Wu and Chen, 1963, p. 59.-Bellan, 1964, p. 112.-Shepherd, 1964, p. 71.-Imajima and Hartman, 1964, p. 286.-Hartmann-Schröder, 1965, p. 211.-Guille and Laubier, 1966, p. 272.-Estcourt, 1967, p. 76.-Banse and Hobson, 1968, p. 29.

Prionospio (*Paraprionospio*) *pinnata inaequibranchia* Caullery, 1914, p. 356.

Prionospio africana Augener, 1918, p. 402.-Monro, 1930, p. 149.

Prionospio alata Moore, 1923, p. 185.

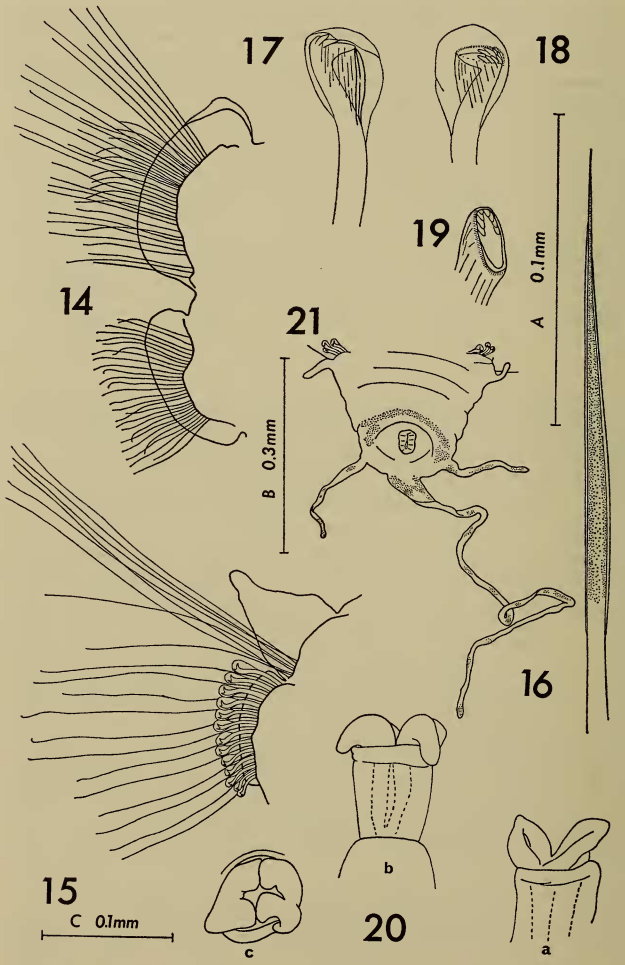
Paraprionospio tribranchiata Berkeley, 1927, p. 415.-Weese, 1933, pp. 20, 21.

Prionospio plumosa Treadwell, 1931, p. 4.

Prionospio tenuis, Hartman, 1945, p. 32.

Prionospio treadwelli Hartman, 1951, p. 84.

Prionospio ornata Berkeley and Berkeley, 1961, p. 660.



Figs. 14–21. *Paraprionospio pinnata.* 14. Setiger eight. 15. Setiger 34. 16. Notoseta from setiger one. 17. Neuropodial hook from posterior setiger. 18. Neuropodial hook showing boundaries of internal hood. 19. Hook with primary hood removed, dorsal view. 20. Everted proboscis: a.

Material examined: Type material of the following: *Prionospio alata* USNM 17369; *Prionospio plumosa* USNM 19596; *P. treadwelli*, Allan Hancock Foundation; *P. ornata* Holotype: USNM 32698 Paratype: USNM 32697. Other material includes collections from the following: PERU coast; Mayaguez, PUERTO RICO; FLORIDA-Cedar Key, Clearwater Beach (4 sta.), Alligator Harbor (8 sta.), off shore Panama City (4 sta.), North Bay near Lynn Haven (4 sta.), Gasparilla Island, Horseshoe Point; Grand Isle, LOUISIANA (76 samples); Port Aransas, TEXAS; Beaufort, NORTH CAROLINA; Yorktown, VIRGINIA; MALDIVES; Gold Coast of W. AFRICA; Capetown, S. AFRICA; Concepción Bay, CHILE; PORTUGUESE GUINEA.

Diagnosis: Body up to 94 mm in length. Prostomium spindle-shaped, inclosed by lateral wings formed by fusion of peristomium and first segment. Three pairs of pinnate branchiae beginning on setiger one. Neuropodial multidentate, hooded hooks begining on setiger nine; notopodial hooks beginning posterior to setiger 19. Pygidum with three anal cirri; two shorter laterals and a longer, unpaired dorsal cirrus.

Description: The prostomium varies slightly in shape, from a very narrow, tapered cylinder to a spindle-shaped structure, widest in the area of the area of the eyes. In the adult, there may be zero to four well-defined prostomial eyes and occasionally there are two larger area of diffuse pigment. The peristomium is fused dorsally and laterally with setiger one, forming an envelope inclosing the prostomium. There are two large wing-like dorsal peristomial expansions which may be closely applied to the prostomium or extended laterally (Fig. 12).

The parapodia of segment one are absent. The palps are rarely present, being extremely deciduous; they are ventrally grooved and often possess a conspicuous basal sheath. The three pair of branchiae are pinnate and very often missing. In the majority of cases where gills are present, one or more are in some stage of regeneration resulting in extreme variation in both number of pinnae and proportion of the shaft which is pinnate. In some instances the regenerating gill is completely smooth. The gills are variable in length and may reach from setiger two to setiger 15. The branchiae begin on the first setiger which is homologous to setiger two in species of *Prionospio*. In some instances, a thread-like filament may arise at the base of the third pair of gills. There is a conspicuous dorsal ridge connecting the two gill bases on setiger one (Fig. 12).

The anteriormost parapodial lamellae are well-developed and notopodial lamellae of setigers one to five are lanceolate (Fig. 13). The cor-

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dorsal view b. ventral view c. anterior view (not drawn to scale). 21. Pygidium, pigmentation shown by stipling. Figs. 16–19, scale A; Figs. 14, 21, scale B; Fig. 15, scale C.

responding neuropodial lamellae are somewhat smaller and less foliaceous. Posterior to setiger five, dorsal and ventral lamellae become increasingly rounded until they are somewhat similar in shape, though those of the neuropodium remains lower (Fig. 14). Progressively the notopodial lamellae become thin and long until posteriorly they are increasingly acuminate (Fig. 15).

Anterior setae are all capillary and similar in appearance. Notopodial setae appear to be in three rows, the posterior row containing the longest setae. The sheath often gives the setae a bilimbate appearance (Fig. 16). Granulations are apparent. In this species, however, they often appear on the sheath rather than the shaft which is where they are usually found. At setiger nine, neuropodial setae change abruptly with the appearance of multidentate hooded hooks accompanied by long, thin companion setae (Fig. 17). There are one to three sabre-setae at the ventral edge of the setal fascicle. Notopodial hooks appear posterior to setiger 19. Both neuro- and notopodial hooks have a large, clear, primary hood and a smaller, internal, secondary hood. The latter is closely applied to the setal shaft and is heavily striated (Figs. 17, 18, 19).

On the dorsal surface between parapodia of a number of specimens, beginning about setiger 20, there are large, clear hyalinelike circles located dorsally with small dots in the center. These circles are accompanied by pouches or thin membranes. The function of these structures is still unknown.

The proboscis is bilobed and cylindrical (Fig. 20). The pygidium bears three anal cirri, a short lateral pair and a single, mid-dorsal, long, thin one (Fig. 21).

Biology: This species has been dredged from substrata composed of mud, mud and clay, and mud and sand. It has been found in thin-walled tubes of mud (Berkeley and Berkeley, 1952) and tubes of fine mud and clay (Wesenberg-Lund, 1949). The only tubes observed on Caribbean specimens are transparent, fibrous and covered by relatively large quartz grains. *P. pinnata* is eurybathyal; found at depths ranging from less than three to 1300 m.

Genus *Aonides* Claparède, 1864

Aonides Claparède, 1864. Type species by monotypy: *A. auricularis* Claparède, 1864, [*A. oxycephala* (Sars, 1862)].

Paranerine Czernizvsky, 1881. Type species by monotypy: *Nerine oxycephala* Sars, 1862.

Etymology: Gender: feminine; *Aonides*—L.—the Boeotian Women, i.e., the Muses.

Diagnosis: Prostomium conical, tapered both anteriorly and posteriorly. Peristomium not well-developed. Branchiae cirriform, separate from dorsal lamellae, beginning on setiger two and present on a variable number of anterior setigers. Hooded hooks present in both notopodia and neuropodia, bidentate or tridentate. Pygidium with anal cirri. Pelagic

and lecithothrophic development. Spherical egg with thick membrane and short-headed sperm with tapered acrosome (Hannerz, 1956).

Aonides mayaguezensis new species

(Figs. 22–33)

Diagnosis: *Aonides* with 15 to 16 pairs of branchiae. Body up to 10 mm in length. Bidentate hooded hooks beginning in neuropodium on setigers 19 to 23 and in notopodium on setigers 21 to 24. With four pygidial cirri, a shorter ventral pair and a longer dorsal pair.

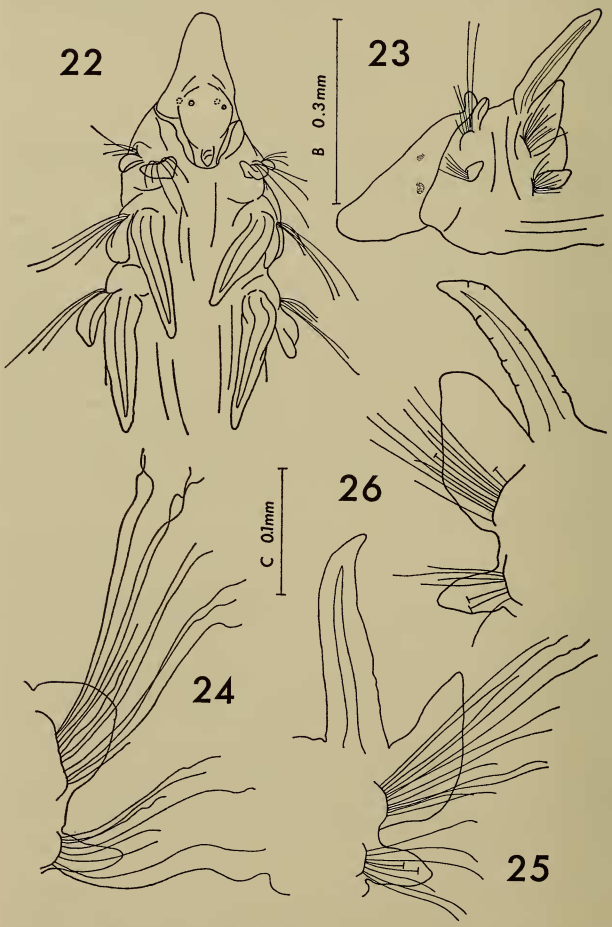
Material examined: Three specimens collected at a depth of 10 feet off Mayaquez, Puerto Rico, August, 1963. Holotype: USNM 39485; Paratype: USNM 39486.

Description: The prostomium is elongate, thin and slightly wider in the region of the eyes (Fig. 22). There is an elevation in the posterior half, at the end of which is a digitiform process or occipital tentacle, which extends to or slightly beyond setiger one (Fig. 23). The prostomium terminates at the level of the first setiger. There are four eyes, the posterior pair being closer together than those of the anterior pair. The posterior pair is located on the prostomial elevation and is easily seen. The anterior pair, however, is found near the base of the elevation and is difficult to detect dorsally (Figs. 22 and 23). The peristomium surrounds the posterior one-third to one-half of the prostomium giving a slight hoodlike appearance.

The anterior branchial region is slightly flattened dorsoventrally. There are 15–16 pairs of branchiae, beginning on setiger two. The gills are almost as long as the body width generally longer than the dorsal lamellae, and are held erect dorsally. The first pair is only slightly, if at all, shorter than those following. The last pair, however, is less than half as long as the preceding and somewhat thinner.

The parapodial lamellae of setiger one differ considerably from those of the following parapodia (Fig. 24). The dorsal lamella is broad, low and subtriangular. The neuropodial lamella, however, is much narrower, almost digitiform. In the following paraodia the notopodial lamellae become increasingly foliaceous and the neuropodial lamellae increase slightly in width (Fig. 25). At about the level of setiger 10, the notopodial lamellae begin decreasing in size (Fig. 26) until they are nearly the same height as those of the neuropodia, though they remain somewhat broader throughout the body length (Fig. 27). The decrease in size is quite abrupt in the postbranchial region.

Anterior setae are capillaries and are arranged in two rows. In the neuropodia the anterior series contains shorter, thicker setae with a slightly wider sheath than those of the posterior row (Figs. 28, 29). There is an obvious sheath but the presence of one or two "limbations" depends on the orientation of the seta (Fig. 30). Granulations are evident on the majority of capillaries. In a notopodial fascicle there are two to three dorsal, extremely thin, non-sheathed capillaries but the others are similar in



Figs. 22–26. *Aonides mayaguezensis* new species. 22. Dorsal view, anterior end. 23. Lateral view, anterior end. 24. Setiger one. 25. Setiger six. 26. Setiger 10. Figs. 22, 23, 25, 26, scale B; Fig. 24, scale C.

appearance and arrangement to those of the neuropodia. Bidentate, hooded neuropodial hooks appear on setiger 19–23 (19, on type-specimen) (Fig. 31). Notopodial hooks of the same type appear on setigers 21–24 (21, on type-specimen) (Fig. 32). There is no obvious secondary hood. The two teeth are widely separated and there are faint striations on the primary hood.

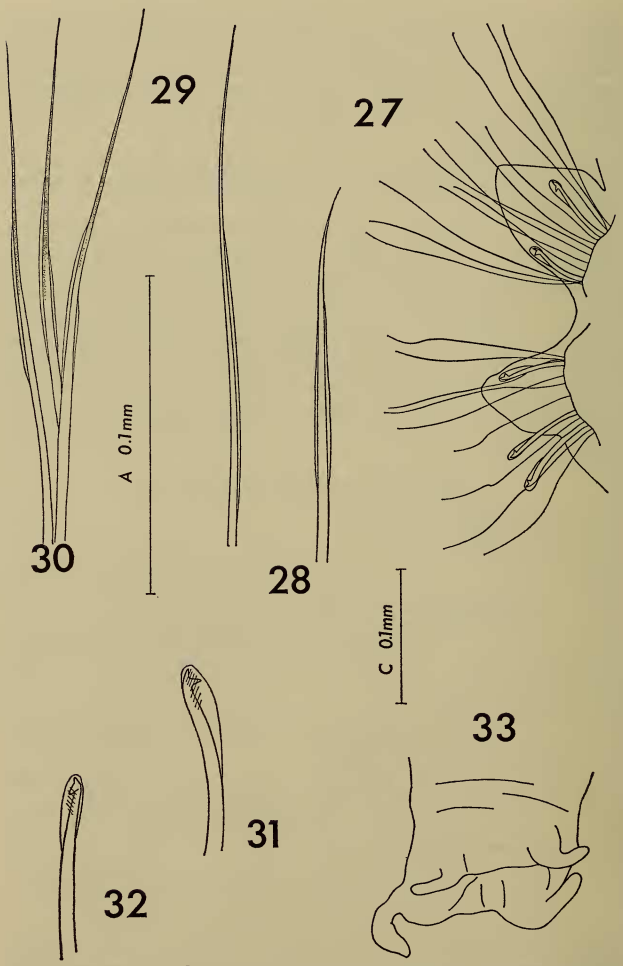
The pygidium is drawn into four anal cirri (Fig. 33). Those of the ventral-most pair are short but about the same thickness as the longer dorsal pair.

Discussion: Two species have been added to *Aonides* since the revision of the genus by Pettibone (1963). Of the species possessing bidentate hooded hooks, *A. mayaguezensis* shows a close affinity to *A. californiensis* Rioja, having similar branchiae, but they differ in the first appearance of neuro- and notopodial hooded hooks. Also, in *A. californiensis* the lamellae of setiger one are low and rounded whereas in the new species the ventral lamellae of this setiger are tapered, almost digitiform. Type material for *A. californiensis* no longer exists (Dra. María Elena Casa Muñoz, personal correspondence) leaving the original description as the only source of comparative information. On this basis, *A. mayaguezensis* is considered a separate species.

KEY TO THE SPECIES OF *AONIDES*

1. Hooded hooks bidentate 2
1. Hooded hooks tridentate ..... *A. paucibranchiata* Southern, 1914, Ireland.
2. Second tooth of hooded hooks with longitudinal grooves, giving a tripartite appearance. Pygidium six anal cirri ..... *A. trifidus* Estcourt, 1967, New Zealand (Estuarine).
2. Second tooth of hooded hooks lacking longitudinal grooves. Pygidium with four anal cirri 3
3. Branchiae 20–30 pairs ..... *A. oxycephala* (Sars, 1862), Mediterranean, Norway.
3. Branchiae fewer than 20 pairs 4
4. Neuropodial hooks beginning on setigers 19–23; notopodial hooks beginning on setigers 21–24. Branchiae 15–16 pairs ..... *A. mayaguezensis* new species, Puerto Rico.
4. Neuropodial hooks beginning on setiger 40; notopodial hooks beginning on setiger 35. Branchiae 13–14 pairs ..... *A. californiensis* Rioja, 1947, Baja, California.

In this paper, *Aonides notoseta* Storch, 1966, from the Red Sea, is not treated as a species of *Aonides* as it does not seem to conform to the generic diagnosis. According to the original description, the principal characters it shares with other species of *Aonides* are presence of anterior branchiae separate from the notopodial lamellae, hooks absent in anterior setigers and presence of anal cirri; none of these being diagnostic generic characters. Other characters which suggest that it does not belong in this



Figs. 27–33. *Aonides mayaguezensis* new species. 27. Setiger 26. 28. Short neuroseta from setiger two. 29. Long neuroseta from setiger two. 30. Three neurosetae from setiger three. 31. Neuropodial hooded hook from setiger 26. 32. Notopodial hooded hook from setiger 26. 33. Pygidium. Figs. 28–32, scale A; Figs. 27, 33, scale C.

genus are branchiae beginning on setiger three, hooks with a node or swelling on the shaft (previously unknown among spionids), threadlike—"fadig"—lamellae and prostomial shape as figured in the original description. No further designation exclusion from *Aonides* will be attempted until type material has been examined.

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